**Before the**
**Federal Communications Commission**
**Washington, D.C. 20554**



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| 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations | ) | IB Docket No. 00-248 |
| Amendment of Part 25 of the Commission's Rules and Regulations to Reduce Alien Carrier Interference Between Fixed-Satellites at Reduced Orbital Spacings and to Revise Application Procedures for Satellite Communication Services | ) | CC Docket No. 86-496 |

**FIFTH REPORT AND ORDER IN IB DOCKET NO. 00-248,**
**AND THIRD REPORT AND ORDER IN CC DOCKET NO. 86-496**

Adopted: March 10, 2005 Released: March 15, 2005

By the Commission:

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## I. INTRODUCTION

1. The rules adopted in this Order today will greatly facilitate the provision of broadband Internet access services, by streamlining the procedures for licensing the types of earth station antennas often used for such services.[1] Satellite-provided broadband Internet access services may provide one of the best potential options for millions of subscribers in the near term.[2] Promoting high speed Internet service is a goal that has been enthusiastically endorsed by the Commission.[3]

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[1] *See* 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Notice of Proposed Rulemaking*, IB Docket No. 00-248, 15 FCC Rcd 25128, 25131 (para. 4) (2000) (*Notice*); 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Further Notice of Proposed Rulemaking*, IB Docket No. 00-248, 17 FCC Rcd 18585, 18588-59 (para. 4) (2002) (*Further Notice*).

[2] *See* Application of EchoStar Communications Corporation, *Hearing Designation Order*,

2. Specifically, the Commission promotes broadband provision in this Order by streamlining the earth station licensing provisions in Part 25. By streamlining Part 25, the Commission also continues to fulfill its statutory mandate under Section 11 of the Communications Act.[4] Our primary goal in this proceeding is to streamline our review of earth station applications that, while they fail to meet the technical standards for routine processing currently in Part 25, can, because of advances in technology, be operated without causing harmful interference to adjacent satellites or terrestrial wireless operations in shared bands. In general, the rule revisions we adopt here apply to conventional C-band earth stations communicating with satellites operating in the geostationary satellite orbit (GSOs), and to conventional Ku-band earth stations communicating with both GSOs and satellites operating in non-geostationary satellite orbits (NGSOs).[5] The rule revisions in this Order do not apply to earth stations operating in other frequency bands unless we specifically state otherwise.

3. We adopt streamlined procedures for considering non-routine earth station applications. An applicant can seek authorization for earth stations with smaller-than-routine antenna sizes under one of two procedural options to demonstrate that it will not cause adjacent satellite interference. It can either (1) reduce the power transmitted from its non-routine antenna so that it appears to be a routine earth station from the perspective of adjacent satellites; or (2) obtain certifications from the operators of the satellites with which the earth station applicant plans to communicate, showing that those satellite operators have coordinated with the operators of satellites located within six degrees of the target satellite, and that those other potentially affected satellite operators do not oppose the non-compliant operations. We also adopt a procedure for applicants seeking to operate earth stations at higher-than-routine power levels. This procedure is identical to the certification procedure for earth stations with non-routine antenna gain patterns, described above.

4. In addition to streamlining the procedures for non-routine earth station applications, we adopt several other measures to streamline or simplify the Commission's rules. We increase the satellite downlink EIRP power spectral density limit for Ku-band earth stations from 6 dBW/4kHz to 10 dBW/4kHz. We allow Ku-band temporary-fixed earth station applicants to begin operations as soon as their applications are placed on public notice. We also clarify our rules for mobile earth station terminals.

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CS Docket No. 01-348, 17 FCC Rcd 20559, 20641-42 (para. 222) (2002), and sources cited therein.

[3] Amendment of Part 15 Regarding New Requirements And Measurement Guidelines For Access Broadband Over Power Line Systems, *Report and Order*, ET Docket No. 04-37, 19 FCC Rcd 21265, 21271 (para. 12) (2004). *See also* Onsat Petition for Waiver to Permit Routine Licensing of 3.7 Meter Transmit and Receive Stations at C-Band, *Order*, 15 FCC Rcd 24488, 24488-89 (para. 2) (Int'l Bur., 2000) (*Onsat Order*), *citing* Extending Wireless Telecommunications Services to Tribal Lands, *Report and Order and Further Notice of Proposed Rule Making*, WT Docket No. 99-266, 15 FCC Rcd 11794 (2000); Federal-State Joint Board on Universal Service, Promoting Deployment and Subscribership in Unserved and Underserved Areas, Including Tribal and Insular Areas, Report and Order, CC Docket No. 96-45, 15 FCC Rcd 12208 (2000).

[4] 47 U.S.C. § 161.

[5] For purposes of this Order, the conventional C-band is the 3700-4200 MHz and 5925-6425 MHz bands. The conventional Ku-band is the 11.7-12.2 GHz and 14.0-14.5 GHz bands.

5. We also adopt several revisions to the very small aperture terminal (VSAT) rules. We relax our VSAT rules to allow multiple hub stations, and to permit temporary fixed earth stations to be used as either hub stations or remote terminals. Finally, we conclude that we can eliminate the aggregate hub earth station EIRP limit now in place for VSAT systems, and rely solely on the -14.0 dBW/4 kHz input power density limit that applies to all transmissions.

6. We expect the rules summarized above to encourage innovation, significantly reduce the filing burdens on applicants and licensees, expedite the licensing process, accelerate the provision of service to the public, and promote broadband service.

7. We adopt many of the rule revisions in this *Fifth Report and Order* while we consider more dramatic revisions to the FSS earth station licensing rules, pursuant to the *Third Further Notice of Proposed Rulemaking*, adopted concurrently with this Order.[6] We intend those rule revisions to give earth station operators more flexibility than is possible under the rules we adopt in this *Fifth Report and Order*.

## II. BACKGROUND

### A. Purpose

8. The Communications Act mandates that transmitting radiocommunication facilities, such as earth stations, must be licensed before they can operate.[7] The rules governing earth stations are contained in Part 25 of the Commission's rules.[8] The rules are intended primarily to ensure that satellite networks can operate with a minimum of interference with respect to each other and with respect to other telecommunications services. Earth stations provide a critical link between satellites and terrestrial networks, and satellite networks depend on the Commission's earth station licensing rules to maintain an operating environment with a minimum of interference to other users operating in the band and to themselves.[9]

9. This proceeding is the latest in a series of efforts to streamline our satellite system licensing rules as much as possible without allowing harmful interference to authorized space station, earth station, or terrestrial operations. Over the years, we have taken action to streamline our satellite and earth station licensing rules and procedures when warranted.[10] In addition, the

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[6] We also resolve certain issues raised in the *Notice* and *Further Notice* in a *Sixth Report and Order* adopted together with the *Third Further Notice*. *See* 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Sixth Report and Order and Third Further Notice of Proposed Rulemaking*, IB Docket No. 00-248, FCC 05-62 (adopted Mar. 10, 2005). We will cite this as the *Sixth Report and Order* when referring to the Report and Order portion of the document, and as the *Third Further Notice* when referring to the Notice of Proposed Rulemaking portion of the document.

[7] 47 U.S.C. § 301.

[8] 47 C.F.R. Part 25.

[9] *Notice*, 15 FCC Rcd at 25130 (para. 3).

[10] Amendment of Part 25 of the Commission's Rules and Regulations to Reduce Alien Carrier Interference Between Fixed-Satellites at Reduced Orbital Spacing and to Revise Application Processing Procedures for Satellite Communications Services, *First Report and Order*, CC Docket No. 86-

International Bureau (Bureau) issued a public notice in 1999 initiating a new licensing process for certain types of earth station applications and inviting comment on a number of additional streamlining proposals.[11] We considered those comments when we developed our proposals for the *Notice*.[12]

10. In addition, Section 11 of the Communications Act requires that the Commission, in every even-numbered year beginning in 1998, review all regulations that apply to the operations and activities of any provider of telecommunications service and determine whether any of these regulations are no longer necessary as the result of meaningful economic competition between providers of the service.[13] Section 11 further instructs the Commission to "repeal or modify any regulation it determines to be no longer necessary in the public interest."[14] Accordingly, in 2000, the Commission initiated a comprehensive review of telecommunications and other regulations to promote meaningful deregulation and streamlining where competition and other considerations warrant such action.[15] This *Fifth Report and Order* furthers our biennial regulatory review of the commercial satellite communications industry, with a particular focus on satellite earth stations.

11. We expect that the rule changes adopted herein will expedite the provision of satellite services to the public, without increasing the risk of harmful or unacceptable interference to existing operators in any significant way. For example, we anticipate our streamlined rules will facilitate satellite Internet services to rural areas. Companies are increasingly using satellite systems to deliver Internet traffic from international points to gateway earth stations and from the public Internet along the "last mile" to earth station antennas at customers' homes, especially in rural environments. We expect our streamlining efforts here to become even more important as the number of earth station applications increases due to the delivery of new services directly to end users.

12. On a long-term basis, in the *Third Further Notice*, we consider off-axis EIRP envelope rules for FSS earth stations in the conventional C-band and Ku-band. As we explain further below, Part 25 currently establishes minimum antenna diameter requirements and maximum power levels for earth stations eligible for routine processing. While the rules adopted in this Order allow us to streamline the review of non-routine earth station applications, those rules also retain minimum antenna diameter requirements and maximum power levels. We intend the off-axis EIRP envelope to give earth station operators flexibility to decrease their power levels to compensate for smaller earth station antennas, or to use larger earth station antennas to

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496, 6 FCC Rcd 2806 (1991) (*1991 Streamlining Order*); Streamlining the Commission's Rules and Regulations for Satellite Application and Licensing Procedures, *Report and Order*, IB Docket No. 95-117, 11 FCC Rcd 21581 (1996) (*1996 Streamlining Order*).

[11] Commission Launches Earth Station Streamlining Initiative, *Public Notice*, DA 99-1259 (released June 25, 1999) (*Ku-band Auto-grant Public Notice*); Commission Launches C-Band Earth Station Streamlining Initiative, *Public Notice*, 15 FCC Rcd 24075 (2000) (*C-Band Auto-grant Public Notice*).

[12] *See Notice*, 15 FCC Rcd at 25130 (para. 3); 25155-56 (para. 85).

[13] 47 U.S.C. § 161(a).

[14] 47 U.S.C. § 161(b).

[15] Federal Communications Commission Biennial Regulatory Review 2000, *Staff Report*, CC Docket No. 00-175, 15 FCC Rcd 21084 (2000) (*2000 Biennial Review Staff Report*).

compensate for higher power levels. We intend this additional flexibility to enable the Commission to increase the number of earth stations eligible for routine treatment. This, in turn, will allow the Commission to expedite its issuance of certain earth station applications considered non-routine under the rules we adopt in this Order.[16]

**B. Procedural History**

13. In response to the *Notice* issued as part of the 2000 biennial regulatory review, 13 parties filed comments, and 11 filed reply comments. In addition, the Satellite Industry Association (SIA) submitted additional proposals in late 2001. The Commission issued a *Further Notice* in 2002, requesting comment on many of the issues raised in SIA's proposals and seeking further comment on one of the issues raised in the *Notice*. In response to the *Further Notice*, five parties filed comments, and five filed replies.[17] In addition, in February 2004, the International Bureau (Bureau) held a status conference with all parties who had filed comments in response to the *Notice* or *Further Notice*, in which the Bureau reviewed all the outstanding issues in this proceeding and invited the parties to supplement their pleadings again. Thus, interested parties have been given multiple opportunities to justify their proposals and to explain their positions on the issues in this proceeding. All these pleadings, as well as other *ex parte* statements addressed in this Order, and the abbreviations we use to refer to the commenters in this Order, are listed in Appendix A.[18]

14. The Commission has already resolved some of the issues raised in this proceeding. Among other things, it established a 15-year license term for earth station licenses,[19] and eliminated the licensing requirement for receive-only earth stations receiving transmissions from non-U.S.-licensed satellites on the Permitted List.[20] The Commission has also adopted a

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[16] In the future, the Commission will also adopt a *Fourth Further Notice* in this proceeding, to invite comment on eliminating Part 23 of its rules.

[17] For purposes of this Order, we refer to the comments filed in response to the *Further Notice* as "Further Comments," and the replies as "Further Replies."

[18] We note that Qualcomm filed a Further Comment, a Further Reply, and several *ex parte* statements, but later withdrew its pleadings in this proceeding. *See* Qualcomm March 31, 2004 *Ex Parte* Statement. We find that allowing Qualcomm to withdraw its pleadings in this proceeding is in the public interest. Therefore, we will not consider further Qualcomm's pleadings in this proceeding.

[19] *See Notice*, 15 FCC Rcd at 25143-44 (paras. 44-45); Amendment of the Commission's Space Station Licensing Rules and Policies, 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Notice of Proposed Rulemaking and First Report and Order*, IB Docket Nos. 02-34 and 00-248, 17 FCC Rcd 3847, 3894-96 (paras. 139-46) (2002) (*First Report and Order*). The Commission also decided to adopt a standardized space station license application form called Schedule S, but invited comment on revisions to the form. *First Report and Order*, 17 FCC Rcd at 3875-79 (paras. 84-94).

[20] Amendment of the Commission's Space Station Licensing Rules and Policies, 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Second Report and Order*, IB Docket Nos. 02-34 and 00-248, 18 FCC Rcd 12507 (2003) (*Second Report and Order*). For more on the Permitted List, see Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States, *Order*, IB Docket No. 96-111, 15 FCC Rcd 7207 (1999) (*DISCO II First Reconsideration Order*).

streamlined form for routine earth station applications, called Form 312 EZ, eliminated several outdated rules, and mandated electronic filing for all earth station filings.[21]

15. In this Order, we consider most of the remaining earth station issues raised in this proceeding. In Section III., we adopt rules to streamline the review process for earth stations that do not meet the earth station technical standards for routine processing. In Section IV., we relax certain earth station requirements. In Section V., we examine several proposals for relaxing our very small aperture terminal (VSAT) rules. In Section VI., we consider other miscellaneous streamlining issues. Section VII. is a conclusion.[22] The rule revisions adopted in Section III. will remain in effect while the rule revisions proposed in the *Third Further Notice* are under consideration. The rest of the rules adopted in this Order will remain in effect on a long-term basis.

16. In the *Notice* and *Further Notice*, the Commission invited comment on antenna gain pattern issues,[23] and issues related to contention protocols in VSAT networks.[24] Because those issues are interrelated with the off-axis EIRP issues we plan to consider in the *Third Further Notice*, we will address those issues in the *Sixth Report and Order* together with that NPRM. We also defer other issues to the *Third Further Notice* in cases where commenters propose rule revisions that are beyond the scope of the *Notice* and *Further Notice*.[25]

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[21] Amendment of the Commission's Space Station Licensing Rules and Policies, 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Third Report and Order and Second Further Notice of Proposed Rulemaking*, IB Docket Nos. 02-34 and 00-248, 18 FCC Rcd 13486 (2003) (*Third Report and Order*); Amendment of the Commission's Space Station Licensing Rules and Policies, 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Fourth Report and Order*, IB Docket Nos. 02-34 and 00-248, 19 FCC Rcd 7419 (2004) (*Fourth Report and Order*).

[22] In addition to the *Notice* and the *Further Notice*, the Commission adopted a *Second Further Notice* together with the *Third Report and Order*, to address certain mandatory electronic filing issues. Amendment of the Commission's Space Station Licensing Rules and Policies, 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, *Third Report and Order and Second Further Notice of Proposed Rulemaking*, IB Docket Nos. 02-34 and 00-248, 18 FCC Rcd 13486, 13514-15 (paras. 83-85) (2003) (*Second Further Notice*). Those issues were resolved in the *Fourth Report and Order*, 19 FCC Rcd at 7421-22 (paras. 3-6).

[23] *Further Notice*, 17 FCC Rcd at 18599-18613 (paras. 29-73).

[24] *Notice*, 15 FCC Rcd at 25146-47 (paras. 54-56); *Further Notice*, 17 FCC Rcd at 18620-21 (paras. 92-95).

[25] *See also* Hughes Comments at 11-12; PanAmSat Comments at 4; Spacenet Reply at 7-8 (proposing adoption of an off-axis EIRP envelope). We will also address these comments in the *Third Further Notice*.

## III. NON-ROUTINE EARTH STATION APPLICATIONS

### A. Background

#### 1. Routine Earth Station Licensing Standards

17. The Commission licensed the first commercial C-band satellites in 1973,[26] and the first Ku-band satellites in 1981.[27] As the satellite industry developed, the Commission, in 1983, established a 2° orbital spacing policy to maximize the number of in-orbit satellites operating in either the conventional C-band or the Ku-band.[28] At that time, the Commission began assigning adjacent in-orbit satellites to orbit locations 2° apart in longitude, rather than the 3° to 4° previously used. The Commission also established technical rules to govern earth stations communicating with satellites at 2° orbital separations to ensure that their operations do not cause unacceptable interference to adjacent satellite systems. These requirements, which are codified in Part 25 of our rules, include earth station antenna diameter and performance requirements and power restrictions.[29] We "routinely" license earth station facilities that meet these technical requirements, without conducting a further technical review to verify that the earth station will not cause unacceptable interference into other satellite systems.[30]

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[26] *Notice*, 15 FCC Rcd at 25132 (para. 7), *citing* Western Union Telegraph Company, *Order and Authorization*, 38 FCC 2d 1197 (1973); Communications Satellite Corporation, *Memorandum Opinion, Order and Authorization*, 42 FCC 2d 677 (1973).

[27] *Notice*, 15 FCC Rcd at 25132 (para. 7), *citing* Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service, *Memorandum Opinion and Order*, 84 FCC 2d 584, 606 (para. 56) (1981).

[28] *Notice*, 15 FCC Rcd at 25132 (para. 7), *citing* Licensing of Space Stations in the Domestic Fixed-Satellite Service and Related Revisions of Part 25 of the Rules and Regulations, *Report and Order*, CC Docket No. 81-704, FCC 83-184, 54 Rad. Reg. 2d 577 (released Aug. 16, 1983), *summary printed in* Licensing Space Stations in the Domestic Fixed-Satellite Service, 48 F.R. 40233 (Sept. 6, 1983) (*Two Degree Spacing Order*). *See also* Licensing of Space Stations in the Domestic Fixed-Satellite Service and Related Revisions of Part 25 of the Rules and Regulations, *Report and Order*, CC Docket No. 81-704, 99 FCC 2d 737 (1985) (*Two Degree Spacing Reconsideration Order*).

[29] 47 C.F.R. §§ 25.134, 25.209, 25.211, 25.212. *See also* Routine Licensing of Earth Station in the 6 GHz and 14 GHz Bands Using Antennas Less than 9 Meters and 5 Meters in Diameter, respectively, for Both Full Transponder and Narrowband Transmissions, *Declaratory Order*, 2 FCC Rcd 2149 (Com. Car. Bur., 1987), *cited in* 47 C.F.R. § 25.134.

[30] *Notice*, 15 FCC Rcd at 25132 (para. 7), *citing* 47 C.F.R. Part 25. For purposes of this Order, we define "routine" earth stations as those that can be licensed without a case-by-case review. In the past, on occasion, the Commission has also used the term "routine" earth station application to mean an application for an ALSAT earth station license in the conventional C-band and Ku-band. In this Order below, however, we adopt a procedure that will enable us to issue an ALSAT earth station license, even though that application required a case-by-case technical review. That procedure requires licensees to lower their off-axis EIRP power levels. *See* Section III.D. Moreover, we note that many of the Part 25 technical requirements are applicable to FSS earth stations other than the conventional C-band and Ku-band, where the ALSAT designation is not applicable.

"ALSAT" means "all U.S.-licensed space stations." Originally, under an ALSAT earth station license, an earth station operator providing fixed-satellite service in the conventional C- and Ku-bands could access any U.S. satellite without additional Commission action, provided that those communications are in accordance with the same technical parameters and conditions established in the earth stations' licenses. *See* Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space

18. In the *Notice*, the Commission explained that it is possible in some cases for an earth station that does not meet all of the technical standards of Part 25 to operate without causing unacceptable interference in a 2° orbital spacing environment.[31] The Commission explained further that it conducts a case-by-case review of each of these "non-routine" earth stations to determine whether the application can be granted.[32] Currently, this review requires the applicant to submit a technical study demonstrating that the proposed earth station will not cause unacceptable interference to 2°-complaint operations.[33] Under the current rules, the preferred form of this technical study is the Adjacent Satellite Interference Analysis (ASIA) program as described in Section 25.134(b).[34] This analysis is often difficult and time consuming to perform, because the information needed for the analysis is not readily available from any one source, and the ASIA results can be subject to interpretation.[35] Some of the data needed for ASIA are available only from individual satellite operators.[36] Further, the operation of the non-compliant earth station antenna must still be coordinated with adjacent satellite operations.[37]

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Stations to Provide Domestic and International Satellite Service in the United States, *Report and Order*, IB Docket No. 96-111, 15 FCC Rcd 7207, 7210-11 (para. 6) (1999) (*DISCO II First Reconsideration Order*). The *DISCO II First Reconsideration Order* expanded ALSAT earth station licenses to allow access to any satellite on the Permitted List. *DISCO II First Reconsideration Order*, 15 FCC Rcd at 7215-16 (para. 19).

[31] *Notice*, 15 FCC Rcd at 25132 (para. 7).

[32] *Notice*, 15 FCC Rcd at 25132 (para. 7).

[33] *Notice*, 15 FCC Rcd at 25134 (para. 13), *citing* 47 C.F.R. § 25.209(f).

[34] *Notice*, 15 FCC Rcd at 25134 (para. 13), *citing* 47 C.F.R. § 25.134(b). Concurrently with the *Two Degree Spacing Reconsideration Order*, the Commission formed an Advisory Committee to obtain technical and operational expertise in implementing Two Degree Spacing standards. Establishment of an Advisory Committee on Implementation of Reduced Orbit Spacing Between Domestic Fixed Satellites, *Order*, 102 FCC 2d 390 (1985). Among the Advisory Committee's recommendations was to adopt ASIA as the generally accepted procedure for calculating adjacent satellite interference. The Commission confirmed this determination in 1996, but also decided to permit licensees and applicants to use their own interference analysis programs, provided that the program is made available to the Commission and the public for review. *1996 Streamlining Order*, 11 FCC Rcd at 21601-02 (para. 50).

[35] Conducting an interference assessment using the ASIA program requires the collection of very specific modulation and link budget parameters for all of the communication links being analyzed. Parameters such as modulation indices, baseband frequencies, data and error correction coding rates, noise temperatures, antenna gains, powers, and sometimes carrier frequency plans are required for the interfering and desired communication links. Once these parameters are collected, the ASIA computer program computes carrier-to-interference (C/I) ratios between the desired and interfering links. Such detailed parameters are not collected in the earth station licensing process and are generally available only from the individual satellite system operators. *See Notice*, 15 FCC Rcd at 25134 (para. 13).

[36] *Notice*, 15 FCC Rcd at 25134 n.24.

[37] *See Notice*, 15 FCC Rcd at 25134 (para. 13).

### 2. Proposed Non-Routine Earth Station Procedures

19. The current procedure for non-routine earth stations often delays the introduction of new services and technological innovation to the public, including broadband Internet access services.[38] In addition, there are strong economic and other incentives to use the smallest possible aperture earth station antenna, in that smaller antennas are less expensive to manufacture, and it is easier to find suitable locations to install smaller antennas.[39] Therefore, the Commission proposed streamlined procedures for non-routine earth stations.

20. The *Notice* invited comment on streamlined processing for two types of non-routine earth station applications: (1) those seeking authority to operate an earth station with an antenna diameter too small to meet the routine processing standards of Part 25;[40] and (2) those seeking authority to operate an earth station at a power level greater than those specified in Part 25.[41] For applications seeking authority to use a small antenna, the Commission proposed two alternative procedures. One procedure would allow the Commission to require the applicant proposing a small antenna to operate at a lower power level to compensate for the smaller antenna diameter.[42] The second procedure, as proposed by the Commission in the *Notice*, would allow applicants to submit affidavits from target satellite operators, verifying that the operation of the small earth station antenna has been coordinated with other satellite operators potentially affected by the proposed non-routine earth station.[43] For applications to operate at non-routine power levels, the Commission proposed only one option, an affidavit procedure. This procedure would be substantially similar to the affidavit procedure now being used for applications proposing non-routine earth station antenna diameters.[44] Finally, the Commission proposed codifying these procedures in Section 25.220 of its rules.[45]

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38 *Notice*, 15 FCC Rcd at 25134 (para. 13).

39 *See Notice*, 15 FCC Rcd at 25134 (para. 12) (noting that there are strong economic incentives in favor of smaller earth station antennas.)

40 The smallest diameter antenna routinely licensed at C-band is 4.5 meters, and the smallest antenna routinely licensed at Ku-band is 1.2 meters in diameter. *See Notice*, 15 FCC Rcd at 25133 (para. 11). The size of the earth station antenna is important since, in general, smaller antennas produce wider transmission beams, which, in turn, can create more potential interference to adjacent satellite operations. *Notice*, 15 FCC Rcd at 25132 (para. 7).

41 *See* 47 C.F.R. §§ 25.134 (VSAT networks), 25.211 (video transmissions), 25.212 (narrowband transmissions); *Notice*, 15 FCC Rcd at 25140 (para. 31).

42 As explained further below, reducing the diameter of an earth station antenna increases the side lobes. Reducing the transmit power of the earth station reduces the side lobes, however, and so can compensate for the reduction in antenna diameter. *See* Section III.D. below. *See also Notice*, 15 FCC Rcd at 25135-36 (paras. 15-19).

43 *Notice*, 15 FCC Rcd at 25136-37 (paras. 20-24).

44 *Notice*, 15 FCC Rcd at 25140-41 (paras. 31-33).

45 *Notice*, 15 FCC Rcd at 25187-88 (App. B).

21. In its 2001 *ex parte* statements, SIA disagreed with several of these proposals. First, SIA would only permit operators in the 5925-6425 MHz band to compensate for smaller-than-routine antennas by reducing their power levels.[46] In addition, SIA would require target satellite operators to coordinate non-routine earth station operations with adjacent satellite operators, regardless of whether the earth station operator planned to lower its power level.[47] SIA also recommended requiring non-routine earth station applicants to submit certifications from all satellite operators within 3° of the target satellite operator to show that coordination is complete, instead of one certification from the target satellite operator.[48] Finally, SIA proposed establishing different standards for (1) routine processing for receive-only earth stations or the receive operations of non-routine transmit/receive earth stations, and (2) protecting such receive earth station operations from interference.[49] SIA's proposed standards for non-routine receive-only earth stations varied depending on antenna size and whether the applicant requested ALSAT authority.[50] SIA initially opposed adopting a streamlined procedure for non-routine receive-only earth stations or the receive operations of non-routine transmit/receive earth stations.[51]

22. The Commission invited comment on SIA's proposal, but also pointed out several areas of concern. First, the Commission found that SIA's proposal to restrict earth station operators' ability to lower their power levels was inconsistent with some of SIA's other proposals.[52] The Commission also found that SIA did not adequately explain why this restriction might be necessary to prevent "substandard" antennas.[53] The Commission observed that SIA's proposal to impose a coordination procedure on earth station operators planning to reduce their power levels might be unreasonably burdensome for earth station applicants.[54] Finally, the Commission noted that the differing standards for transmit and receive operations was confusing.[55] The Commission invited SIA and other interested parties to address these concerns.[56]

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46 *Further Notice*, 17 FCC Rcd at 18630 (para. 124), *citing* SIA December 10, 2001 *Ex Parte* Statement at 28.

47 *Further Notice*, 17 FCC Rcd at 18630 (para. 124), *citing* SIA December 10, 2001 *Ex Parte* Statement at 28.

48 *Further Notice*, 17 FCC Rcd at 18630 (para. 125), *citing* SIA December 10, 2001 *Ex Parte* Statement at 28. *See also* SIA December 10 *Ex Parte* Statement, App. at 19-20 (SIA's proposed Section 25.220(c)).

49 *See Further Notice*, 17 FCC Rcd at 18631 (para. 126). *See also* SIA December 10 *Ex Parte* Statement at 28, and App. at 13.

50 SIA December 10 *Ex Parte* Statement, App. at 13.

51 SIA December 10 *Ex Parte* Statement at 28.

52 *Further Notice*, 17 FCC Rcd at 18631 (para. 127).

53 *Further Notice*, 17 FCC Rcd at 18631-32 (para. 128).

54 *Further Notice*, 17 FCC Rcd at 18632 (para. 129).

55 *Further Notice*, 17 FCC Rcd at 18632-33 (paras. 130-31).

56 *Further Notice*, 17 FCC Rcd at 18633 (para. 132).

23. In its further comments, SIA revised parts of its proposal. First, SIA would allow both conventional C-band and conventional Ku-band earth station applicants to lower their power levels as a means of compensating for smaller-than-routine earth station antennas, provided that the earth station operations are coordinated.[57] SIA further recommends re-defining "non-routine" as exceeding the antenna gain pattern envelope in Section 25.209, rather than on the basis of antenna size.[58] However, SIA continues to recommend determining whether an earth station is routine based only on the antenna gain pattern for its transmit operations, and repeats its original proposal to protect transmit/receive antennas from interference only to the extent that an antenna consistent with the requirements of Section 25.209(a) would not receive interference.[59] SIA would also process all receive-only earth stations routinely, because they cannot cause interference.[60]

24. SIA continues to oppose allowing earth station operators to lower their power levels without also coordinating with adjacent satellites, however.[61] SIA would also still require that the target satellite operator negotiate coordination agreements on behalf of the earth station operators. SIA further explains that the coordination agreements themselves should be attached to the earth station license application.[62]

**B. General Framework**

25. *Background.* Andrew Corporation, Astrolink, and Hughes support the Commission's general approach for processing non-routine earth stations.[63] SIA maintains that the current

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[57] SIA Further Comments at 24.

[58] SIA Further Comments at 24.

[59] SIA Further Comments at 23, *citing* 47 C.F.R. § 25.209(c); SIA February 1, 2005 *Ex Parte* Statement at Att.

[60] SIA Further Comments at 23, *citing* 47 C.F.R. § 25.209(c).

[61] SIA Further Comments at 23; SIA March 23, 2004 *Ex Parte* Statement at 3; SIA February 1, 2005 *Ex Parte* Statement at Att.

[62] SIA Further Comments at 23. In this proceeding, we have directed our attention to SIA's proposals for non-routine earth station applications. In addition, SIA made several proposals with respect to routine earth stations, including proposed rule revisions intended to increase the number of earth stations considered routine. Many of SIA's proposals involved the antenna gain pattern requirements in Section 25.209, and many proposals included revised application information requirements. For example, SIA advocates treating Ku-band earth stations routinely if the antenna gain pattern intersects the antenna gain pattern envelope between 1.5° and 1.8° off-axis, and non-routine either (1) provides SIA's proposed antenna pointing accuracy demonstration discussed above, or (2) coordinates its operations with adjacent satellite operators. SIA Further Comments at 23. The Commission addresses this proposal together with other antenna gain pattern issues in the *Sixth Report and Order*.

[63] Andrew Corporation Comments at 1-3; Astrolink Comments at 3-4; Hughes Reply at 2. These parties recommend slight modifications to the proposed procedures. We address these recommendations below.

procedure is very burdensome.[64] Astrolink, however, argues that the proposed procedures should not be applied to Ka-band earth stations because Section 25.138 of the Commission's rules already contains similar requirements for Ka-band earth stations.[65] Andrew Corporation states that Section 25.220, which is intended to codify the new procedures, might be easier to understand if it addressed transmit and receive stations separately.[66] In contrast, Spacenet asserts that the Commission's proposed procedures are more burdensome than the current procedure, and so might limit development of broadband services to rural areas.[67]

26. In support of its revised proposal, SIA argues that routine processing should be based only on the antenna gain pattern of the transmit operations of an earth station antenna, regardless of the receive operations of that antenna.[68] SIA claims that continuing to base eligibility for routine processing on both transmit and receive antenna gain patterns would substantially undercut the benefits of starting the antenna gain pattern envelope at a greater off-axis angle. This is because, according to SIA, basing the routine determination on the receive pattern of a 0.74-meter-equivalent antenna would disqualify that antenna from routine treatment.[69] SIA also repeats its concern that allowing earth stations to reduce their power levels, absent coordination, might cause "underperforming" antennas to proliferate.[70] SIA does not provide any further explanation for its proposal.

27. Spacenet opposes SIA's proposal because it is so complex as to defeat the purpose of streamlining the procedure for non-routine earth stations.[71] Spacenet is also concerned that SIA's proposal would increase the burdens of coordination for earth station operators.[72] Similarly, Aloha Networks points out that SIA's procedure would impose unnecessary burdens on VSAT

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64 SIA November 5, 2001 *Ex Parte* Statement, Att. 2 at 1.

65 Astrolink Comments at 3-4.

66 Andrew Corporation Comments at 3.

67 Spacenet Comments at 5-10.

68 SIA Further Comments at 8-9.

69 SIA Further Comments at 9.

70 SIA Further Comments at 23. *See also* SIA March 23, 2004 *Ex Parte* Statement at 3.

71 Spacenet Further Comments at 20.

72 Spacenet Further Comments at 20. *See also* Boeing April 14, 2004 *Ex Parte* Statement; Boeing April 19, 2004 *Ex Parte* Statement (supporting a procedure for Earth Stations on Vessels (ESVs) and Aeronautical Mobile Satellite Service (AMSS) earth stations similar to the power reduction procedure we adopt below, and arguing that SIA's proposal would be "inappropriate" for these services). The Commission adopted procedures for ESVs recently in another Order. Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and 14.0-14.5 GHz/11.7-12.2 GHz Bands, *Report and Order*, IB Docket No. 02-10, FCC 04-286 (released Jan. 6, 2005) (*ESV Order*). The Commission is also considering rules for AMSS earth stations in another proceeding. Service Rules and Procedures to Govern the Use of Aeronautical Mobile Satellite Service Earth Stations in Frequency Bands Allocated to the Fixed Satellite Service, *Notice of Proposed Rulemaking*, IB Docket No. 05-20, FCC 05-14 (released Feb. 9, 2005) (*AMSS NPRM*).

applicants by requiring coordination for non-conforming antennas regardless of the transmit power density level.[73]

28. *Discussion.* We adopt our proposed streamlined procedure for non-routine earth station applications, with minor revisions. We disagree with Spacenet that the procedures for non-routine earth station applications proposed in the *Notice* are more burdensome than the current procedures. As explained in the *Notice*, it is often difficult and time consuming to prepare the ASIA.[74] Accordingly, we adopt our proposal to replace the current ASIA requirement for non-routine earth station license applications with a procedure that allows applicants to choose between (1) operating at reduced power levels, and (2) obtaining certifications from target satellite operators showing that the non-routine earth station has been coordinated with potentially affected satellite operators. In Appendix D to this Order, we provide a step-by-step outline of the certification procedure we adopt here. Below, we address specific issues raised by implementation of these procedures.

29. We agree with Astrolink that the procedures in Section 25.138 are sufficient for Ka-band earth stations.[75] No other commenter supported Andrew Corporation's suggested revisions to Section 25.220, to have transmit and receive operations addressed separately, nor do we see how such revisions would make the rule easier to understand. Section 25.220 specifies the streamlined procedures available to non-routine earth station applicants, and the authority available under each procedure.

30. Finally, we conclude that the procedure we adopt here is preferable to the non-routine earth station procedures that SIA proposed in its *ex parte* statements and its Further Comments. As an initial matter, we agree with Spacenet that SIA's proposals are unduly complex, and would increase the burdens of coordination for earth station operators.[76] SIA would distinguish between routine and non-routine earth stations based on whether their antennas meet the antenna gain pattern envelope.[77] The purpose of distinguishing between routine and non-routine earth station antennas is to identify a class of earth stations that can be licensed without a case-by-case engineering review.[78] SIA's approach would compel the Commission to conduct a case-by-case engineering review simply to determine whether to treat an earth station application routinely. The Commission has explained in the past that introducing an unnecessarily complex

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[73] Aloha Networks May 12, 2004 *Ex Parte* Statement at 1.

[74] *Notice*, 15 FCC Rcd at 25134 (para. 13).

[75] Section 25.138 was adopted in Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use, *Report and Order*, IB Docket No. 98-172, 15 FCC Rcd 13430 (2000) (*18 GHz Band Report and Order*).

[76] Spacenet Further Comments at 20.

[77] SIA Further Comments at 24.

[78] *Notice*, 15 FCC Rcd at 25132 (para. 7); *Further Notice*, 17 FCC Rcd at 18587-88 (para. 3).

categorization into Commission procedures can frustrate the public interest by requiring more time to fit each application into its proper category.[79]

31. In addition, other than clarifying and explaining its proposal to treat an earth station's transmit operations differently from its receive operations, SIA has not addressed many of the concerns the Commission raised in the *Further Notice*.[80] In particular, SIA does not explain why an antenna with a smaller-than-routine diameter is necessarily substandard, or how it expects its proposed coordination procedure would affect the proliferation of substandard antennas.

32. In response to SIA's recommendation to protect transmit/receive antennas from interference only to the extent that an antenna consistent with the requirements of Section 25.209(a) would not be expected to receive interference,[81] we observe that this is what is required in the Commission's rules now.[82] We will not adopt SIA's recommendation to refrain from applying routine standards to receive-only earth stations, and the receive operations of transmit/receive earth stations, however.[83] Recently, in the *Second Space Station Reform Order*, the Commission made it clear that routine licensing standards apply to receive-only earth stations just as much as transmit/receive earth stations.[84] The Commission relied on this requirement in determining how much it could eliminate its licensing requirement for receive-only earth stations receiving transmissions from non-U.S.-licensed satellites on the Permitted List, but only for routine receive-only earth stations.[85] SIA does not persuade us to revisit these issues.

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79 *Third Report and Order*, 18 FCC Rcd at 13513 (para. 77). *See also Further Notice*, 17 FCC Rcd at 18609 (para. 59) (noting that SIA's proposals might be unnecessarily complex.)

80 *See Further Notice*, 17 FCC Rcd at 18631-32 (paras. 127-29) (discussion of Commission concerns regarding SIA's 2001 *ex parte* proposals).

81 SIA Further Comments at 23.

82 47 C.F.R. § 25.209(c).

83 SIA Further Comments at 23.

84 Amendment of the Commission's Space Station Licensing Rules and Policies, *Second Report and Order*, IB Docket No. 02-34, 18 FCC Rcd 12507, 12517 (para. 22) (2003), *citing* Televisa International, LLC, *Order and Authorization*, 13 FCC Rcd 10074 (Int'l Bur., 1997) (*Televisa Order*). The *Televisa Order* explains that non-routine receive-only earth stations may be susceptible to harmful interference in a two-degree-spacing environment, and conditioned a blanket license for non-routine receive-only earth stations on a requirement to label the earth stations to warn customers that the Commission cannot protect those earth stations from harmful interference.

85 Most receive-only earth stations are not required to be licensed at all. *See* Regulation of Domestic Receive-Only Satellite Earth Stations, *First Report and Order*, CC Docket No. 78-374, 74 FCC 2d 205 (1979) (*Receive-Only Earth Station Permissive Licensing Order*); *1991 Streamlining Order*, 6 FCC Rcd at 2807 (para. 7). In 1997, the Commission required some receive-only earth stations to be licensed, those that receive transmissions from non-U.S.-licensed space stations, to maintain jurisdiction over the space station's operations in the United States. Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States, *Report and Order*, IB Docket No. 96-111, 12 FCC Rcd 24094, 24179-80 (para. 201) (1997) (*DISCO II*). The Commission relaxed this receive-only earth station licensing requirement in the *Second Space Station Reform Order*, and now allows unlicensed routine receive-only earth stations to receive transmissions in the conventional C-band and Ku-band from non-U.S.-licensed space stations on the Permitted List. *Second Space Station Reform Order*, 18 FCC Rcd at 12516-17 (paras. 20-22).

Accordingly, we will continue to treat the receive operations of non-routine earth stations as we have in the past. Such earth stations will be protected from harmful interference only to the extent that routine earth stations are protected,[86] and may be conditioned on the licensee warning its customers about the potential for harmful interference.[87]

33. We are confident that lowering the transmit power of non-routine earth stations, without coordination, is sufficient to protect adjacent satellite operators and terrestrial wireless licensees from harmful interference. The Commission will review all such earth station applications to determine whether the power has been lowered sufficiently, and will prohibit earth station licensees from operating in excess of that power level by putting a condition in the license. Thus, to the extent that SIA is concerned that an earth station operator may nevertheless increase its power levels after we grant its license, such operation would violate that license condition and could lead to a forfeiture penalty. We do not anticipate many such forfeitures, however, because it has been the Commission's experience that earth station operators generally comply with the terms of their licenses, and that forfeiture penalties are therefore unnecessary.

34. In summary, we conclude that adoption of the streamlined non-routine earth station procedure proposed in the *Notice* would reduce administrative burdens on non-routine earth station applicants, and facilitate Internet service to rural and unserved areas, without unreasonably increasing the risk of harmful interference to adjacent satellite systems. Below, we address pleadings addressing specific issues with respect to the streamlined non-routine earth station procedure we adopt here.

### C. Non-Routine Antenna Size

#### 1. Background

35. As we recognized in the *Notice*, there are strong economic and other incentives to use the smallest possible aperture earth station antenna.[88] Allowing an antenna to operate with side lobes in excess of the Section 25.209 envelope, without making some other adjustment such as reducing input power spectral density levels, creates a potential for unacceptable interference to adjacent satellite systems.[89] Accordingly, we invited comment on two alternatives to the ASIA requirement for reviewing applications proposing earth stations with non-routine diameters: (1) power reductions, and (2) affidavits demonstrating coordination with affected adjacent satellite operations. We discuss both these proposals below.

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86 47 C.F.R. § 25.209(c).

87 *See Televisa Order*, 13 FCC Rcd 10074.

88 Smaller antennas are less expensive to manufacture, and it is easier to find suitable locations to install smaller antennas. In addition, improvements of transmitter and receiver technology on board satellites have enabled satellite communications systems to decrease earth station antenna diameters without affecting service performance. *Notice*, 15 FCC Rcd at 25134 (para. 12).

89 *Notice*, 15 FCC Rcd at 25133 (para. 10).

**2. Power Reductions**

36. *Background.* In the *Notice*, the Commission explained that reducing the transmitted power of a non-routine diameter earth station can reduce the side lobe energy to levels that fall within the levels that would be produced if the maximum allowable power level were transmitted by an antenna that complies with the antenna gain pattern envelope in Sections 25.209(a) and (b).[90] Accordingly, the Commission proposed to implement an equivalent isotropically radiated power (EIRP) density versus off-axis angle criterion beginning at 1° off-axis.[91] In this way, the off-axis EIRP density would be maintained at a level equivalent to that provided by routine earth stations at 2° and beyond.[92] The Commission stated that it would continue to process these earth station applications on a case-by-case basis, but that this procedure would enable it to process those applications more rapidly.[93]

37. While a power reduction by itself should be sufficient to prevent the non-routine diameter earth station from causing interference to other satellite systems, it would not affect the potential for other satellite systems to cause interference into the non-routine earth station.[94] Therefore, the Commission tentatively concluded in the *Notice* that non-routine earth stations taking advantage of the option to lower their power should not be granted protection from interference from other satellite systems, unless they also obtain the affidavits discussed below.[95] It also proposed that non-routine sized earth stations reducing their power should be eligible for ALSAT earth station licenses for transmit-only operations and for transmit/receive operations where the earth station operator does not request any protection from adjacent satellite interference to its receive operations.[96]

38. *Discussion.* GE Americom finds this approach reasonable, provided that the operator of the satellite with which the non-routine earth station is operating monitors the reduced power level, and that the earth station must accept the same level of interference that a routine earth station must tolerate.[97] Loral notes that the Commission has adopted this approach on a case-by-case basis with no harmful effects.[98] Onsat supports this power reduction proposal as an alternative to the affidavit procedure because it has found difficulty in obtaining affidavits from other satellite operators in the past.[99]

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90 *Notice*, 15 FCC Rcd at 25135 (para. 15).

91 *Notice*, 15 FCC Rcd at 25135 (para. 15).

92 *Notice*, 15 FCC Rcd at 25135 (para. 15).

93 *Notice*, 15 FCC Rcd at 25135 (para. 15).

94 *Notice*, 15 FCC Rcd at 25135 (para. 16).

95 *Notice*, 15 FCC Rcd at 25135 (para. 16).

96 *Notice*, 15 FCC Rcd at 25135 (para. 16).

97 GE Americom Comments at 5-6.

98 Loral Comments at 4-5. *See also* Telesat Comments at 2 (there is precedent for the power reduction approach for coordinating non-routine operations).

99 Onsat Reply at 2-4. The International Bureau (Bureau) authorized Onsat to operate a

39. PanAmSat, however, asserts that this procedure would be burdensome for operators of potentially affected satellites.[100] PanAmSat is concerned that adopting the Commission's proposed streamlined procedure would allow the number of smaller-than-routine antennas to increase, without providing sufficient assurance that those earth stations will not cause harmful interference to routine operations. PanAmSat is also concerned that the proposal blurs the bright line between routine and non-routine earth stations.[101] Spacenet seems to interpret the power reduction proposal, intended to give applicants one option to seek authority to use non-routine antennas, as a *requirement* that all non-routine antennas operate at reduced power, and it opposes such a requirement.[102]

40. We adopt the proposal to facilitate licensing of earth stations with smaller-than-routine antennas by allowing the applicant to reduce its power to compensate for the smaller antenna size. Contrary to PanAmSat's contention, this power reduction process should prevent non-routine diameter earth stations from causing harmful interference into other satellite systems. We will continue to review non-routine earth stations on a case-by-case basis, and we will not grant any earth station application proposing a non-routine antenna size without determining that the power reduction is sufficient to prevent harmful interference into other satellite systems. We also disagree with PanAmSat that this new procedure blurs the distinction between routine and non-routine earth stations. Rather, this new procedure enables us to process certain non-routine earth station applications more quickly than we do currently. The power reduction procedure is similar to the procedure in effect for VSAT systems,[103] and we have not experienced any problems with this procedure in that context.

41. Accordingly, applicants seeking authority to operate an earth station with a non-routine antenna diameter may expedite the processing of their applications by reducing their transmit power levels dB for dB to compensate for the amount that their antenna gain patterns exceed the Section 25.209 envelope. In other words, we will process non-routine earth station applications more quickly if the applicant reduces its proposed power levels enough to reduce the EIRP levels in the antenna's side lobes below the limits implied by the combination of Section 25.209 and the relevant power level requirements[104] at all off-axis angles.[105] This will enable

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CSAT system using 3.7-meter C-band earth station antennas, based in part on an affidavit from its target satellite operator. *Onsat Order*, 15 FCC Rcd at 24491-92 (para. 8). Onsat maintains that it may be difficult for an earth station operator to obtain an affidavit from an adjacent satellite operator, with whom it does not have a contractual relationship. Onsat Reply at 3-4. We note that earth station operators electing the certification procedure we adopt below will be required to obtain certification only from the target satellite operator with whom they have contracted to communicate.

100 PanAmSat Comments at 4.

101 PanAmSat Comments at 2-3; PanAmSat Reply at 1.

102 Spacenet Comments at 14-22 (*emphasis added*).

103 *See* 47 C.F.R. § 25.134(c).

104 The "relevant power requirements" are in Section 25.134 for VSAT systems, and in Section 25.212 for other earth stations.

105 Section 25.209(a) allows licensees to exceed the antenna gain pattern envelope at off-axis angles greater than 7°, but by no more than 10 percent of the sidelobe, and no sidelobe is allowed to exceed

earth station applicants to request authority for smaller-than-routine antenna sizes without undergoing the ASIA process.[106] It will also allow us to grant earth station applications proposing sufficient power reductions without requiring coordination with adjacent satellite operators, provided that there are no other defects in the application.

42. By requiring applicants using this process to decrease their EIRP levels at all off-axis angles, these earth stations will appear like routine earth stations to adjacent satellites. Therefore, we adopt the Commission's proposal to grant ALSAT licenses to these earth station applicants. We also will not extend protection from receiving interference to non-routine earth stations whose operators reduce their power and do not obtain coordination agreements with adjacent satellite operators.[107] We will include this provision as a condition on earth station licenses granted pursuant to this process. In addition, we place those licensees on notice that they will be required to accept interference from a licensed operator operating within the limits of Section 25.209 and the relevant power limits, or in other words, ALSAT-designated earth stations meeting routine processing requirements.

43. Finally, contrary to Spacenet's assertion otherwise, we are not requiring earth station operators to reduce their power. This is simply one option available to applicants seeking authority to use antennas with non-routine antenna sizes. Non-routine earth station applicants are also free to proceed under the affidavit process discussed below. Of course, applicants are also free to apply for licenses to use routine antennas at routine power levels.

### 3. Affidavits or Certifications

44. *Background.* As an alternative to reducing power, we also proposed to allow earth station operators using smaller-than-routine antennas to coordinate their use of a higher level of power with all potentially affected satellite within 6° of the target satellite, and with terrestrial operators.[108] We proposed to expedite review of these applications by permitting applicants to submit information on the antennas they propose to use, and an affidavit from the operator of each satellite with which it plans to communicate.[109] We envisioned that these affidavits would show that the target satellite operator has coordinated the proposed earth station operations with affected satellite systems, and terrestrial systems, where appropriate.[110] Also, the Commission proposed requiring that the affidavits show that the satellite operator will take the earth station into account when negotiating future coordination agreements.[111] The *Notice* proposed requiring coordination with operators of satellites as far as six degrees away.[112]

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the envelope by more than 3 dB.

106 *Notice*, 15 FCC Rcd at 25135-36 (para. 17).

107 *Notice*, 15 FCC Rcd at 25135 (para. 16). We make this clear in Section 25.220(c) that we adopt today. *See* App. B.

108 *Notice*, 15 FCC Rcd at 25136 (para. 20).

109 *Notice*, 15 FCC Rcd at 25136 (para. 21).

110 *Notice*, 15 FCC Rcd at 25136-37 (para. 21).

111 *Notice*, 15 FCC Rcd at 25136-37 (para. 21).

112 *Notice*, 15 FCC Rcd at 25136-37 (para. 21). Our experience with nonconforming earth

45. Because the affidavits provide certainty that the earth station will neither cause unacceptable interference to nor receive unacceptable interference from adjacent satellite systems, we proposed to extend protection from receiving interference to the smaller-than-routine earth station antennas while they operate over the particular satellites that have coordinated such operations.[113] We also proposed limiting earth stations licensed under this process to communicating with the specific satellites that have been coordinated.[114] This is because affidavits from adjacent satellite operators in a particular segment of the geostationary satellite orbital arc by themselves do not support a conclusion that the non-routine earth station will not cause unacceptable interference to or receive unacceptable interference from satellite systems in other segments of the GSO arc.[115]

46. *Discussion.* Several commenters suggest minor revisions to this procedure. First, Loral states that we should refer to the statements from satellite operators as "certifications" rather than "affidavits," because affidavits must be notarized and meet other legal requirements.[116] We agree.

47. Spacenet argues that operators of earth stations with smaller-than-routine antennas should be required to coordinate only with satellites located at off-axis angles at which the earth station exceeds the envelope.[117] We agree. If an earth station antenna's side lobes do not exceed the Section 25.209 envelope at, for example, four degrees off-axis, then the earth station will not cause harmful interference to a satellite located four degrees away from the target satellite if the power density into that antenna meets the applicable Part 25 rule. In that case, no useful purpose would be served by requiring the target satellite operator to coordinate with the operator of the satellite four degrees away prior to submission of the earth station application. Furthermore, in the event that a target satellite operator incorrectly concludes that a non-routine earth station's antenna will not affect a particular satellite, and decides not to coordinate with the operator of that satellite, that affected satellite operator will be given an opportunity to comment in response to the public notice procedure discussed below.

48. Telesat recommends requiring satellite operators to indicate that the smaller-than-routine antenna has been coordinated with all satellite operations within six degrees of the

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stations operations demonstrates that, if coordination is completed with adjacent satellite operations plus or minus six degrees of the satellite that is accessed, the potential for unacceptable adjacent satellite interference is significantly reduced. *Notice*, 15 FCC Rcd at 25137 n.31. In cases where a non-routine antenna might affect a satellite more than six degrees, and the operator of the satellite communicating with the earth station had not coordinated with the operator of the satellite eight degrees away, we stated that we would give the operator of the potentially affected satellite an opportunity to raise its concerns. *Notice*, 15 FCC Rcd at 25137 (para. 22).

113 *Notice*, 15 FCC Rcd at 25137 (para. 23).

114 *Notice*, 15 FCC Rcd at 25137 (para. 23).

115 *Notice*, 15 FCC Rcd at 25137 (para. 23).

116 Loral Comments at 5-6.

117 Spacenet Reply at 9-10.

satellite with which the earth station will operate, both U.S.-licensed and non-U.S.-licensed.[118] We agree that earth stations with smaller-than-routine antennas should be coordinated with all potentially affected satellites within 6° of the target satellite providing service in the United States, regardless of whether the satellite is licensed by the United States or another administration.[119] The potentially affected satellite operators may not, however, include all satellites within 6° of the target satellite, depending on the sidelobe characteristics of the antenna as discussed above.

49. Telesat also maintains that the certifications should take into account the possibility that earth station operators using smaller-than-routine antennas may have to reduce their power to accommodate future potentially affected satellites.[120] Spacenet replies that this is inconsistent with the general philosophy that licensees have a right to be protected from others that start operations at a later date.[121] We agree with Telesat. Licensees of non-two-degree-compliant operations are not generally protected from interference from two-degree-compliant operations, regardless of whether the compliant operations start before or after the non-compliant operations, and they must protect future compliant services.[122] We expect, though, that in cases where a coordination agreement had previously been established, the parties will continue to honor that agreement when they begin operation of future replacement satellites, or seek a change to that agreement to take into account any new parameters associated with the replacement satellite.

50. We also conclude that parties opposing this certification procedure do not provide sufficient reasons for rejecting it. We disagree with Spacenet that the proposed certification procedure could delay introduction of services because it would give adjacent satellite operators an opportunity to "drag their feet" in coordination discussions.[123] As an initial matter, in order to expedite the certification process, we will require the target satellite operator rather than the adjacent satellite operators to coordinate with and provide the adjacent operators' certification letters to the earth station applicant. Since the earth station operator will be a customer of the target satellite operator, the target satellite operator has an incentive to obtain the certifications.[124]

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118 Telesat Comments at 2.

119 While we do not require coordination with satellites that do not provide service to the United States as part of our streamlined procedure for non-routine earth stations we adopt here, that coordination may be required by other Administrations.

120 Telesat Comments at 3-4.

121 Spacenet Reply at 10-12.

122 *See* Telesat Canada, Request for Declaratory Ruling of Petition for Waiver on Earth Stations' Use of ANIK E1 and E2 Satellite Capacity to Provide Basic Telecommunications Service in the United States, *Order*, 15 FCC Rcd 3649, 3654-55 (para. 16) (Int'l Bur., 1999) (where Telesat had not shown that its satellites were two-degree-compliant, it was required to coordinate with future two-degree-compliant satellite systems or operate on a non-harmful interference basis relative to those systems with respect to services provided in the United States).

123 Spacenet Comments at 22-24. Although Spacenet opposes the Commission's certification proposal, it supports the Commission's proposal to establish a 60-day period to resolve coordination issues. Spacenet Comments at 42-43. We address issues related to the 60-day coordination period below. *See* Seciton III.E.3.c., *infra*.

124 As we explain further below, adjacent satellite operators will be given an opportunity to

In addition, because satellite operators have coordination discussions with each other on a regular basis, it is in their mutual interest to cooperate with each other, and in our experience, they do. Therefore, they should not have any incentive to stall the discussions. Further, we have consistently historically required that earth station operators proposing non-routine parameters bear the burden of obtaining coordination agreements.[125] By allowing earth station operators to shift some of this burden to target space station operators, we expect to expedite licensing.[126] Further, if the coordination agreements cannot be reached with all affected satellite operators, the earth station applicant may always choose to lower power as a means to obtain a license.

51. PanAmSat characterizes this procedure as a premature proposal to enforce a non-existent standard.[127] PanAmSat apparently argues that adjacent satellite operators are unable to determine whether they can accommodate non-routine earth station operations unless the Commission adopts a "standard" for non-routine earth stations. We find this argument unpersuasive. Satellite operators are aware of the link budgets and other operating parameters of their satellite systems, and are capable of determining whether a given non-routine earth station operating at a given power level can be accommodated within those link budgets, transponder plans, or business plans. In the coordination process, satellite operators use refined analyses to determine whether earth station operations can be accommodated on specific frequencies, and therefore could be granted. Satellite operators do not need the Commission to adopt standards for non-routine earth station operations to make that determination.

52. Consequently, we adopt our proposal to expedite our review of smaller-than-routine earth station antennas by allowing applicants to submit, as exhibits to their applications, certifications from the operators of the satellites with which they intend to communicate that demonstrate that all affected satellite operators have taken the non-routine operations into account in their coordination negotiations.[128] These certifications should be obtained through coordination negotiations between the target satellite operator and potentially affected satellite operators. As we observed in the *Notice,* this procedure enables us to eliminate the burdens associated with the ASIA requirement, while still ensuring that communications with those earth station antennas will not cause unacceptable interference into "routine" operations.[129] Finally, because this certification procedure applies to all smaller-than-routine antennas, including VSAT antennas, we delete Section 25.134(c) of the Commission's rules, which now requires VSAT

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comment if they disagree with the target satellite operator whether coordination has been completed.

125 *See, e.g.*, 47 C.F.R. § 25.134(c).

126 We also observe that earth station operators are free to expedite this process further by performing an interference analysis that demonstrates the lack of or the level of potential interference from the proposed earth station operations and serving it on the target and adjacent satellite operators.

127 PanAmSat Comments at 4.

128 The requirements for these certifications are spelled out in the rule revisions we adopt in Appendix B. In summary, the certifications must state that adjacent satellite operators are aware of the non-routine earth station operations, that the earth station will not cause harmful interference into those adjacent satellite operations, and the satellite operators can tolerate any interference that may be caused by those earth station operations.

129 *Notice*, 15 FCC Rcd at 25136 (para. 21).

licensees rather than the satellite operator to coordinate with operators of future two-degree-compliant satellites, as inconsistent with this procedure.[130]

### 4. Other Non-Routine Antenna Gain Pattern Issues

#### a. Submission of Antenna Gain Patterns

53. We explained in the *Notice* that we require applicants seeking authority to use non-routine earth station antennas to certify that certain specific antenna radiation pattern tests have been performed, including co- and cross-polarization, at the bottom, middle, and top of each allocated frequency band, in both the vertical and horizontal planes, plus and minus nine degrees.[131] Nevertheless, to assess the interference potential fully, we often request the applicant to submit copies of the antenna gain patterns for these test plots.[132] These requests can be time-consuming.[133] Therefore, we invited comment on requiring earth station applicants to submit a copy of these antenna gain patterns when they seek authority to use a smaller-than-routine antenna,[134] as part of both the power reduction and certification procedures.

54. Loral and PanAmSat support this proposal, while no comments were received in opposition.[135] Accordingly, we adopt it. Submission of antenna gain patterns will pose minimal additional burdens on non-routine earth station license applicants, and will enable the Commission to process their applications more rapidly.[136] This information is vital for calculating the needed power reduction. It will also assist operators of satellites located more than six degrees from the target satellite in determining whether their operations will be affected by the smaller-than-routine earth station antenna.

55. In addition to submitting these patterns to the Commission, PanAmSat recommends that we require applicants to serve antenna gain patterns on potentially affected satellite operators, to expedite coordination of those non-routine earth station operations.[137] GE Americom agrees and would also require non-routine earth station operators to provide potentially affected satellite

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130 *See* 47 C.F.R. § 25.134(c). *See also* Hughes Comments at 27-28; SIA December 10, 2001 *Ex Parte* Statement at 29-30.

131 *Notice*, 15 FCC Rcd at 25138 (para. 25), *citing* 47 C.F.R. § 25.132(a).

132 *Notice*, 15 FCC Rcd at 25138 (para. 25), *citing* 47 C.F.R. § 25.132(b)(1).

133 *Notice*, 15 FCC Rcd at 25138 (para. 25).

134 *Notice*, 15 FCC Rcd at 25138 (para. 25).

135 Loral Comments at 10; PanAmSat Comments at 5. *See also* Spacenet Comments at 43-44, 46.

136 The Commission argued that an antenna gain pattern requirement would pose minimal additional burdens on earth station applicants because the earth station operator has an established relationship with its antenna manufacturer. *Notice*, 15 FCC Rcd at 25138 (para. 26).

137 PanAmSat Comments at 5. *See also* SIA Reply at 5; Hughes Reply at 11 (applications should be served on "adjacent satellite operators +/- 6 degrees of each satellite with which the non-routine applicant seeks to coordinate").